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Analysis of Interconnection Cost Models

Strategic Issues

Final Report

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Introduction

The policy objective underlying interconnection is the support for a fully competitive, efficient retail market provided by competition among interconnected network operators. This entails providing full opportunity for competitors to offer service and, accordingly, the elimination of monopoly (or duopoly) profit which may be embedded in interconnection charges.

Competing network operators are ‘horizontally’ related in that they provide substitute services as well as ‘vertically’ as they provide – on a monopoly basis – terminating access to their customers. Regulatory policy that successfully addresses market power in this vertical relation can then facilitate full horizontal, retail competition with relatively light –handed price regulation such as a focus on predatory pricing and/or a price squeeze by the dominant operator.

The TRC currently permits interconnection charges to be set on the basis of Fully Allocated Costs (FAC) including a reasonable rate of return on capital. In 2005, due to likely liberalization of international gateways and services and the stated objective for mobile-to-mobile termination rates, this use of FAC will be replaced – in practice – with the use of Long Run Average Incremental Costs (LRAIC) principles, again including a reasonable return on capital.

This Report, accordingly, examines and estimates interconnection rates that should be approved by the TRC during the transition year of 2004.

Overview

This Report follows the recent ‘Review of the Fully Allocated Cost Models’ conducted for the TRC. That Review involved a first-cut review of the models submitted by Jordan Telecommunications (JT), Fastlink (FL) and MobileCom (MC), an identification of a few particular concerns and a spot-check of a few service categories.

The Review also noted that FAC models are ‘inherently arbitrary’ due to the allocation mechanisms that are used to apportion common, overhead and ‘non-network’ costs among services. The Review noted that some inputs and allocations used in the various models were ‘questionable’ and that none of the operators provided adequate documentation.

This Report examines specific concerns in each of the operator models, quantifies to the extent possible the marginal impact on interconnection rates, estimates appropriate interconnection charges for major termination rates and reviews the resultant estimates in the context of on-going and future TRC policy determinations.

The models submitted by JT, FL and MC differ dramatically in terms of detail, documentation and structure as well as assumptions concerning allocation mechanisms. The focus of this Report for JT is international wholesale service and for FL and MC mobile-to-mobile terminating interconnection rates.

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As a general matter:

1. JT allocates a very high proportion of non-network 'wholesale' costs to international service charges to the mobile operators.
2. FL utilizes a relatively small common cost amount but allocates retail costs to terminating access and computes a 'margin' on 'non-network' costs in its calculations. There are also capital (net book) value discrepancies between various versions of the model and audited financial statements.
3. MC employs a relatively high level of common costs, an excessive Weighted Average Cost of Capital (WACC) and an undefined 'discount' factor that actually increases net book value (NBV) beyond the stated value.

Conclusions:

- The high JT rates for international wholesale prices will be reduced according to a 'glidepath' of cost-plus rates becoming effective January 1st, 2004 to cost-based rates to become effective at the end of 2004. These rates must be approved by the TRC and will need to consider whether there is an 'access deficit' in setting the 'plus' component of the rates (the analysis below contends that there is not) but also realize that there can be no flow through of lower wholesale rates to retail rates. In this regard, it needs to be recognized that the high allocation of non-network costs to international wholesale is transitory as liberalization in 2005 will generate market-determined LRAIC pricing.

The resulting relatively low non-network cost allocation to national services allows the TRC, for the first six months of 2004, to further study the JT submission, subject to a principle that all national interconnection service rates meet a 'retail price less avoidable cost' standard.

- Excluding from the FL model only the obviously incorrect allocation of some retail costs to the mobile-to-mobile termination rates results in a value of 58 fils/minute. Correcting for other marginal considerations can result in rates as low as 53 fils/minute.
- Correcting the MC model to a reasonable WACC, eliminating the undefined discount factor applied to NBV and assuming reasonable – if not low – levels of traffic beyond the early 2003 level to reflect market size and possibly market share growth, also results in estimates of mobile-to-mobile termination rates of 56 fils/minute.

Jordan Telecommunications Model

International service is essentially covered as a sub-category of 'voice' service. A large proportion of various capital costs, e.g. 42% of 'network computers and systems', are included in this category even though the actual marginal costs of

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providing international wholesale is comprised of modification of its billing system. Of non-network costs in the MC model, 'wholesale' comprises 16% of the total.

Also, JT computes a return (WACC of 16.5%) on the average capital investment 'in progress' i.e. development projects that are not yet actually providing service.

Further, JT allocates common and wholesale costs on the basis of 'equivalent proportional markup' across categories based principally on the relative capital investment attributable to the various services.

The above factors all combine to apportion a large amount of cost to international service.

Last, the model provides a computation of the access deficit and obtains a value of JD 51.8 million.

Comments:

JT's desire to allocate as much of its non-network costs into the international wholesale service category as possible is fully understandable. There is a clear expectation that the JT monopoly on international gateway services will be eliminated in next year's Fixed Line Policy Framework. With the introduction of liberalization JT will be forced to write down (if not off entirely) a great deal of the book value of its international transmission facilities as the current excess supply of such facilities will set the cost structure for new gateway operators. This is exactly what has happened for international network operators in competitive markets during the last two years such as Level 3 and Global Crossing. Hong Kong-based Reach Networks, an international joint venture between PCCW HKT (previously Hong Kong Telecom) and Telstra has literally written down the value of its network to zero.

Accordingly, JT's behavior is quite rational as 2004 will be its last chance to recover at least some of this excess of book value over economic value.

This, however, may not actually be a significant problem to the TRC for two reasons:

1. The high allocation of non-network costs to international wholesale service reduces the amount allocated to retail services. Accordingly, interconnection rates for national services and retail prices will more closely approximate actual cost.

JT has recently agreed to provide by the end of January 2004, 'cost plus' international wholesale rates (to become effective January 1, 2004) as a means of eliminating the 'retail minus' discount model. As part of this agreement, JT has also accepted the principle of setting a 'glidepath' for these 'cost plus' rates so that, by January of 2005, international rates will be cost-based. As JT has told the TRC that it will be introducing 'efficiencies' in its international network during 2004, the mechanism for reducing the 'value' of JT's international network toward economic value has been identified.

A related matter is the access deficit. The JT provides a computation which indicates a value of JD 51.8 million, which presumably can be offset – at least to some extent –

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in the 'cost plus' wholesale rates. There are some concerns, however, with this computation.

First, the only revenue included in this computation seems to be the monthly line rental charges and one-time setup charges for residential and business subscribers. No revenue for:

- a) local and national usage (although this may result in a small increase in the access deficit but should be included to have a complete model),
- b) ADSL service (the cost is included) or
- c) the 'contribution' [revenue minus FAC] of international traffic that originates and terminates on the JT network.

Second, costs for ISDN and leased lines should be deducted from the computation.

The JT model does not provide sufficient information to estimate 'contribution' toward the access deficit from ADSL, ISDN and leased line services. However, the JD 51.8 million access deficit is offset by including the 'contribution' from all measured PSTN services carried on those access lines i.e. that originate and terminate on the JT network:

<u>'CONTRIBUTION'</u>	<u>AMOUNT</u>
access	- 51.8
local	-3.6
national	+1.5
int'l outbound	+38.6
int'l inbound	+19.1
total	+3.8

Accordingly, no 'contribution' is required from 'cost plus' wholesale rates, especially as JT has – through 2004 – the ability to set minimum retail prices. It is this exact ability, however, that raises a dilemma for the TRC as reductions in wholesale prices cannot flow through to retail prices, except to the limited amount that the mobile operators add a few piasters to the JD price. The JT proposal for price flexibility indicates that JT intends to experiment by lowering retail prices on routes with 'elastic' demand and conceivably raising prices on routes with inelastic demand. Either of these actions, however, will increase revenue and therefore not have a negative impact on any 'access deficit'.

The issue before the TRC is to manage the glidepath which involves:

- a) whether to permit JT to introduce 'efficiencies' but keep some or all of the written down book value in its wholesale rates (January and July 2004), and
- b) what level of wholesale profit margin is to be included in the wholesale rates
- c) ensuring that JT does not create a 'price squeeze' (as has FL) by setting retail prices below wholesale.

Fastlink Model

This is by far the most complicated of the models. Numerous interconnected matrices are involved and following the flow of a particular cost element is extremely difficult. Additionally, FL has provided a number of versions of the model which have inconsistencies with each other and also with audited financial statements. In all versions, however, FL employs a WACC of 18%.

However, the level of common and overhead costs that need to be allocated is relatively low (compared with those of MC) which reduces some concerns with the model.

This structure enables a close examination of a small number of high impact assumptions:

- a) the inclusion of costs of retail services being allocated to mobile-to-mobile interconnection rates
- b) the inclusion of the cost of the operating license being allocated to mobile-to-mobile interconnection rates
- c) the inclusion of a 'margin' on non-network costs being allocated to mobile-to-mobile interconnection rates.
- d) An increase in NBV of network assets between August 13th and September 4th of JD 3 million.
- e) A lower NBV of network assets in audited financial statements than in the September 4th submission.

A number of sensitivity analyses were conducted to determine the effect of these assumptions. The results are as follows:

<u>MODEL</u>	<u>COST FOR JT</u>	<u>COST FOR MC</u>	<u>COST FOR INT'L</u>
FL Sept 4 (last)	94 fils/minute	77 fils/minute	87 fils/minute
1. w/o retail	68	58	65
2. w/o retail & license cost	68	58	65
3. w/o retail, license costs & non-net 'margin'	63	55	61
4. NBV from Aug 13 & 3 above	61	53	59
5. NBV from audited statement & 3 above	62	54	60

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The last two sensitivity studies – numbers 4 and 5 – are probably mutually exclusive but FL documentation doesn't permit complete understanding of the disparities.

Comments:

The adjustments above, although not all those which could be studied with a great deal of effort and cooperation from FL, indicate a high degree of sensitivity for the mobile-to-mobile termination rate, in particular to the inclusion of an allocation of retail costs. As no logical argument can be made for the inclusion of such costs, the TRC is in a very strong position to require that this interconnection rate should be dramatically reduced.

This would provide a number of beneficial effects on the Jordanian market:

- a) such a change would be a good first step to the utilization of LRAIC-based costs in the future, particularly if January 2005 would be set by the TRC for adoption of such a principle.
- b) such a change would support more efficient service pricing and, in doing so, create a better competitive opportunity for newly licensed operators.
- c) Such a change would facilitate any future TRC decisions related to on-net pricing of a dominant operator by allowing the use of a rule requiring that dominant operators 'impute' terminating interconnection costs into their retail prices without necessarily requiring any increase in current retail prices.

Also, FL provides a peak/off-peak analysis which contends that there are no direct network costs in the off-peak period. As the issue of a peak load interconnection rate structure should be a topic of future research by the TRC, this material should be kept on file.

MobileCom Model

This model is relatively simple compared to that of FL but raises unique concerns.

First, MC employs a WACC of 25% compared to 18% for FL and 16.5% for JT. There is no justification for such a high WACC presented by MC.

Second, MC applies this 25% WACC to net book value multiplied by a 'discount factor' (again no justification is provided) which is actually – once formulae are traced – 1.55 so that the computed annual return on capital is 25% of 155% of net book value !

The MC model has been rerun to correct for both of these factors and the results are presented below.

There is, however, a more fundamental issue related to the construction of the FAC model presented by MC. This issue is the use of the current traffic volume in computation of per minute 'costs'. The MC network has only been completed in the last few years and has, by MC's estimates, a usable life of 8.5 years for network equipment and 14 years for buildings, etc. As a startup, second licensee which is

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unable to expand their customer base due to FL pricing behavior (as MC contends and supported by the TRC Decision with respect to the associated Complaint) MC's current traffic level is far less than that utilized in MC's network investment decisions. That decision, assuming rationality, would project some time stream or average traffic level over the economically usable life of the network to determine average unit costs.

As the current level of traffic, due to being early in the life-cycle of the company as well as the anti-competitive behavior of FL, is below the projected average use, the cost estimates – due to the very high proportion of fixed cost for any network industry - which are generated by the MC model are overstated.

There are, then, two sets of adjustments required for the MC model.

In the first instance, using a WACC of 18% and a 'discount factor' of 1.0 (so that the annual return on capital is 18% of net book value) the mobile –to-mobile terminating interconnection rate is computed at 69.8 fils/minute – as opposed to 82.4 fils/minute in the MC submission which uses 25% WACC and the 1.55 'discount factor'.

Further adjustment of the MC traffic level beyond the 2002/2003 (first quarter to first quarter) level in the model to reflect a higher volume over the life of the network results in:

<u>TRAFFIC LEVEL INCREASE</u>	<u>INTERCONNECTION COST</u>
10%	63.4 fils/minute
25%	55.8
50%	46.5

Comments:

With the adjustments identified above, the MC model generates mobile-to-mobile interconnection rates very similar to those in the FL model. The traffic increase for MC necessary to have a level 25% higher than the current level – only 6% increase of the total industry minutes at present – should easily be achieved through growth in the market over the next six years (remaining depreciable life of network assets), improved market share, and especially the increased incoming traffic to MC that can be expected from FL's upcoming reductions in off-net pricing.

Conclusion

On the basis of the adjustments made so that reasonable assumptions are used in both the FL and MC models, an interconnection rate in the range of 53-58 fils/minute seems appropriate.